

COLORADO STATE FOREST SERVICE
COLORADO STATE UNIVERSITY

COLORADO FORESTRY BEST MANAGEMENT PRACTICES

Forest Stewardship Guidelines for Water Quality Protection

2025 Field Monitoring Report

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EXECUTIVE SUMMARY

With the increasing frequency and intensity of drought, the value of water is rapidly escalating throughout Colorado and therefore must be protected from nonpoint source pollution. Drought conditions have exacerbated overstocked forest conditions contributing to increased insect activity and frequency of high-intensity wildfires. These circumstances require that the pace and scale of forest treatments rapidly expand across the state. A primary water quality concern following forest treatment is sediment movement and delivery to surface water. To proactively protect water quality, Colorado implements best management practices (BMPs) for forestry activities. Forestry BMPs are a set of water-quality protection measures and guidelines that provide direction on planning, roads, streamside management zones (SMZs), timber harvesting, pesticides and fertilizers, stream crossings and fire management. Compliance with BMPs in Colorado is voluntary and administered within a non-regulatory framework.

In August 2025, an interdisciplinary monitoring team visited five forest treatment sites in the northern Front Range region of Colorado to assess Colorado forestry BMP application and effectiveness. Sites were selected from a combination of federal, private and county lands. Each site was evaluated on BMP criteria described in the Field Monitoring Rating Guide (Appendix A), which includes planning, roads, SMZs, timber harvesting, hazardous substances, stream crossings and fire management.

The 2025 monitoring team found that the general application of BMPs at the five sites met the BMP standards 96% of the time. Minor departures from the application of BMPs were rare and occurred 7% of the time. No major departures nor instances of gross neglect from the BMPs were noted. By and large, the 2025 monitoring results were consistent with the previous eight monitoring efforts that have taken place over the past 13 years, in that forest treatment work across Colorado is being accomplished while taking necessary precautions to protect water and soil resources.

ACKNOWLEDGEMENTS

As part of its continuing efforts to develop and provide education on protecting water quality during forestry and silviculture operations, the Colorado State Forest Service (CSFS) organized the 2025 BMP field monitoring trip. The BMP field monitoring program is an ongoing effort that began in 2008 with the initiation of the first audit. In 2011, a follow-up re-audit report was written to document the effectiveness of several BMPs on four of the six original sites. The program is now conducted on a biennial schedule; four field monitoring trips occurred in even years from 2012 through 2018. Due to travel restrictions and safety measures, the BMP field monitoring trip planned for 2020 was delayed until 2021. Therefore, for the foreseeable future the biennial schedule will continue in odd-numbered years with the next field monitoring scheduled for 2027.

The following individuals served on the 2025 field monitoring team:

- Tony Auciello — Jefferson County Open Space
- Lucy Bauer — Colorado State Tree Farm Committee
- Mark Loveall — Colorado State Forest Service
- Megan Maxwell — Colorado Timber Industry Association
- Diana Selby — Colorado State Forest Service

The CSFS is grateful to these individuals and their agencies/organizations for contributing to the CSFS 2025 forestry BMP field monitoring. In addition, the CSFS values the assistance and cooperation of contractors, landowners and local agency personnel for participation in and support of this effort.

INTRODUCTION

The headwaters of all of Colorado's major rivers originate in the state's forested lands, where forests help produce high-quality water. Across the state, at least 80% of the population relies on this for domestic water supply. These waters also provide for municipal supply, irrigation, livestock, recreation and industrial uses, and they support important fisheries in Colorado, 18 other states and Mexico. It is essential that landowners and managers take the necessary measures to maintain surface water quality.

The U.S. Environmental Protection Agency (EPA) classifies forestry and silviculture activities as potential sources of nonpoint source (NPS) pollution under the Clean Water Act. The EPA describes NPS pollution as follows:

> ***NPS pollution generally results from land runoff, precipitation, atmospheric deposition, drainage, seepage or hydrologic modification. NPS pollution, unlike pollution from industrial and sewage treatment plants, comes from many diffuse sources. NPS pollution is caused by rainfall or snowmelt moving over and through the ground. As the runoff moves, it picks up and carries away natural and human-made pollutants, finally depositing them into lakes, rivers, wetlands, coastal waters and ground waters.***

Forest treatments are implemented on federal, private and state forested lands throughout Colorado. Though caution is taken during these operations, standard practices can have potential negative impacts. Excessive sediment entering waterways, usually from roads and/or skid trails, is the most common NPS pollution from forestry and silviculture activities. Typical treatment practices may include construction and use of forest roads, skid trails and landings. These activities remove vegetative cover and can result in soil compaction, thus reducing precipitation infiltration rates. If poorly planned, located or constructed, these structures can intercept other surface waters, concentrate surface flow and transport sediment into receiving waters. These potential sources of pollution are preventable if forestry and timber harvest BMPs are implemented.

The Colorado Timber Industry Association (CTIA) and the CSFS developed *Colorado Forest Stewardship Guidelines to Protect Water Quality, Best Management Practices (BMPs)* for Colorado in 1998. The CTIA, CSFS, the Colorado NPS Task Force and EPA provided funding for this publication, which is now out of print.

In 2008, the CSFS received funding from the Colorado Water Quality Control Division of the Colorado Department of Public Health and Environment to update forestry BMPs for Colorado. The resulting booklet, *Forestry Best Management Practices to Protect Water Quality in Colorado*, was published in 2010 and was updated and revised again in late 2023. This publication is available in print at all CSFS locations and online.

At the time of the 2023 field monitoring, the updated BMP guide was not available, and the Field Rating Criteria used by the monitoring team corresponded to the previous 2010 version of the BMP guide. Prior to the 2025 field monitoring, the Field Rating Criteria were revised to correspond to the sequence and language of the 2023 BMP guide. No criteria were added or deleted from the previous criteria list, with only slight language edits made to improve clarity.

The Colorado Forestry BMP Monitoring process is designed to spot check BMP compliance across the state and serve as an educational opportunity for forestry landowners, practitioners and contractors. The 2020 Colorado Forest Action Plan identifies 24 million acres of forest and woodlands, with roughly 65% in federal ownership and 30% in private ownership. Colorado's 2012 NPS Management Plan states that "nearly 37% of the total surface land and water of the state is federally owned, largely in headwaters areas."

The number of projects that span multiple ownerships continues to increase with the application of cooperative agreements and programs such as the Good Neighbor Authority (GNA). Permanently authorized in the 2014 Farm Bill and amended in subsequent legislation, GNA enables states, counties and Indian tribes to act as an agent of the USDA Forest Service (USFS), Bureau of Land Management (BLM), U.S. Fish and Wildlife Service (USFWS) and National Park Service to complete authorized restoration services on federal and non-federal lands. In 2025, one project located on federal land was a GNA project administered by the CSFS.

Using the field monitoring rating guide criteria (Appendix A), each site was evaluated on key components of the forest treatment project, including planning, roads, SMZs, timber harvesting, hazardous substances, stream crossings and fire management. BMP compliance was evaluated based on two criteria for each practice – application and effectiveness. The application rating indicated the degree of compliance with suggested BMP methodology, and the effectiveness rating established whether the practice, as applied, was sufficient to achieve the intended protection of water resources.

The 2025 Colorado forestry BMP monitoring was the eighth comprehensive BMP monitoring for the state. The monitoring was conducted on five forest treatment project sites. Land ownership on the sites included three on private property, one on federal land and one on county land.

The 2025 BMP field monitoring was funded by the CSFS. This report details the findings of that monitoring effort.

2025 MONITORING OBJECTIVES

The role of the 2025 monitoring team was to evaluate the voluntary compliance to BMP standards detailed in the 2023 publication *Forestry Best Management Practices to Protect Water Quality in Colorado*.

The overall goal was to proactively spot check the implementation of the state forestry BMPs and evaluate the effectiveness of each on selected sites. The CSFS will ultimately use these findings to improve logger education and BMP publications.

2025 monitoring report objectives

1. Monitor the effects of timber harvesting operations on water quality on selected sites
2. Monitor the avoidance and protection of wetland soil and water resources during harvest/treatment and road construction on selected sites
3. Monitor road-building effects (temporary/permanent roads/trails) in riparian areas on selected sites
4. Evaluate the level of fuels treatment/timber harvest planning and design needed to maintain or improve the hydrographic character of timberlands, protecting soils from erosion and streams from sedimentation during runoff periods on selected sites
5. Evaluate the protection of SMZs under the BMPs on selected sites
6. Evaluate the use and/or handling of hazardous substances, where applicable

MONITORING PROCESS

Site nomination

The CSFS solicited site nominations from the USFS, BLM, CSFS, CTIA and forestry consultants. Site nominations were requested for fuel treatments/timber sales on federal, private and state forestlands with the greatest potential to affect water quality. The following baseline criteria were requested for nominations:

1. Sale/treatment has the potential to affect water quality
2. Minimum of 1,000 board feet/or 1 Mbf (2 cunits or 2 CCF) per acre were harvested/masticated/removed
3. Sale/treatment was completed within the last two years
4. Sale/treatment was located along the Northern Front Range of Colorado (Larimer, Boulder, Gilpin, Clear Creek, Jefferson and Park counties)

The minimum requirement of 1 Mbf harvested per acre was used to ensure that sales/treatments with only marginal potential to affect water quality were not selected. In addition, many of the sales/treatments in the state occur in areas where little or no live water or other sensitive hydrologic resources are present. While many BMPs are applicable to such sales/treatments, the monitoring focused on areas with potential to affect water quality.

The location criteria for the 2025 monitoring consisted of counties within three CSFS field office coverages (Fort Collins, Boulder and Golden). Previous monitoring has been conducted in other areas of the state. The long-term intent is to cover all forested areas within Colorado that satisfy the first three criteria of site selection on a rotating basis.

Soliciting for site nominations was unusually difficult because of budget constraints across agencies and subsequent staffing uncertainties, and the CSFS received only five project nominations. Fortunately, all nominated projects met the criteria listed above. The ownership of the land on which the projects occurred was diverse: three on private land, one on federal land (USFS) and one on county-owned land.

Overview of selected sites

Five forest treatment projects were visited for monitoring within the geographical boundaries of three CSFS field offices along Colorado's northern Front Range (Figure 1) in order to complete the monitoring within one week.

To maintain confidentiality and privacy, ownership and specific locations of the selected sites are not identified in this report. Only type of land classification is disclosed (i.e., federal, private, state or multiple). Forestry contractor/logging companies were also not identified.

MONITORING PROCEDURE

Field monitoring was conducted over three days, and the monitoring team spent approximately 2-4 hours on each forest treatment project. All five members of the 2025 monitoring team had participated in at least one previous BMP monitoring effort and/or federal BMP consistency review in one or more states over the last few years, bringing experience, efficiency and consistency to the 2025 effort.

Personnel directly associated with each project (project planning, layout and/or sale administration) briefed the monitoring team on details of the work that occurred at each location. Areas of particular importance, such as SMZs, roads and landing areas near the riparian corridor were identified, as were project administration details. The monitoring team was given an opportunity to inspect the area.

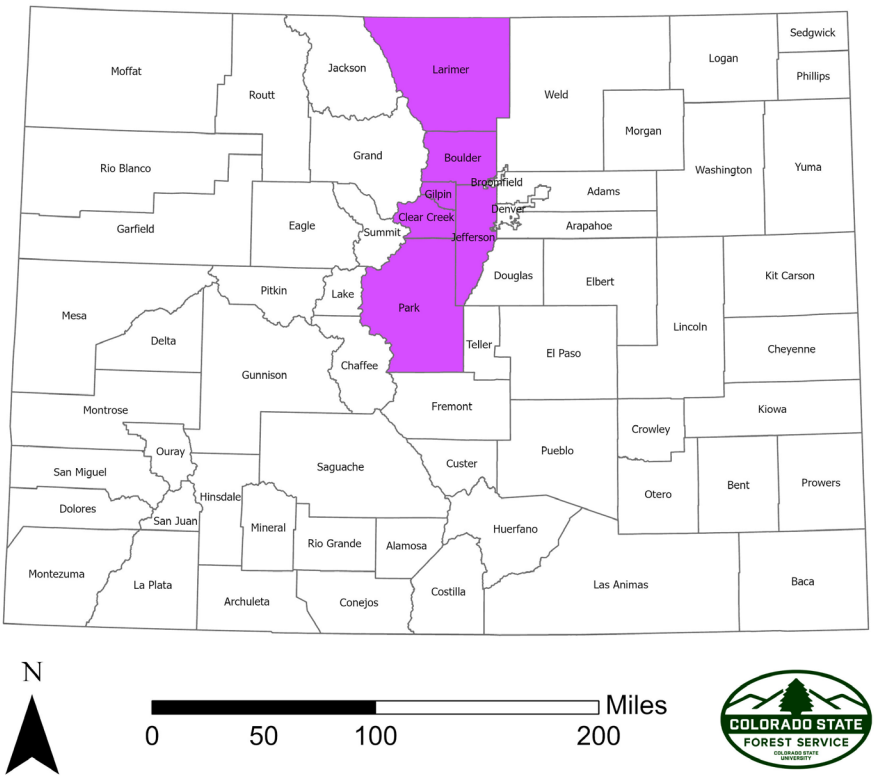

Figure 1. *Counties selected for the 2025 Colorado forestry BMP field monitoring. Map: CSFS*



Photo 1: *Project administrators brief the 2025 monitoring team on objectives, occurrences and outcomes of the treatments within a project unit. Photo: Mark Loveall, CSFS*



Photo 2: *The 2025 monitoring team and project administrators inspect a riparian area adjacent to a treatment unit. Photo: Mark Loveall, CSFS*

No effort was made to inspect each acre of the harvested area or each mile of road; rather, the monitoring focused on the critical portions of each project where proper BMP application was most important. The information presented in this report is based on the observational data obtained from each site.

Following inspection of the treatment area, the monitoring team then reconvened to evaluate the applicable BMPs for each site through observation and discussion. After reaching consensus on applicability, an on-site team leader recorded the application and effectiveness rating for each of the BMP items. A different member of the monitoring team acted as team leader at each location. The BMP Field Monitoring Data and Rating Guide Criteria are in Appendix A.

The rating process conducted for each BMP begins with establishing whether the BMP in question is applicable to the forest treatment activities under consideration (see Figure 5). For example, not all fuel treatments require the construction of temporary roads. In these cases, the BMPs that pertain to temporary roads are not applicable. Once the monitoring team establishes that a given BMP is applicable, the application rating for the BMP is determined, based on written criteria (Table 1).



Photo 3: *The 2025 monitoring team discusses its impressions and works to reach consensus following a walk-through of treatment units. Photo: Mark Loveall, CSFS*

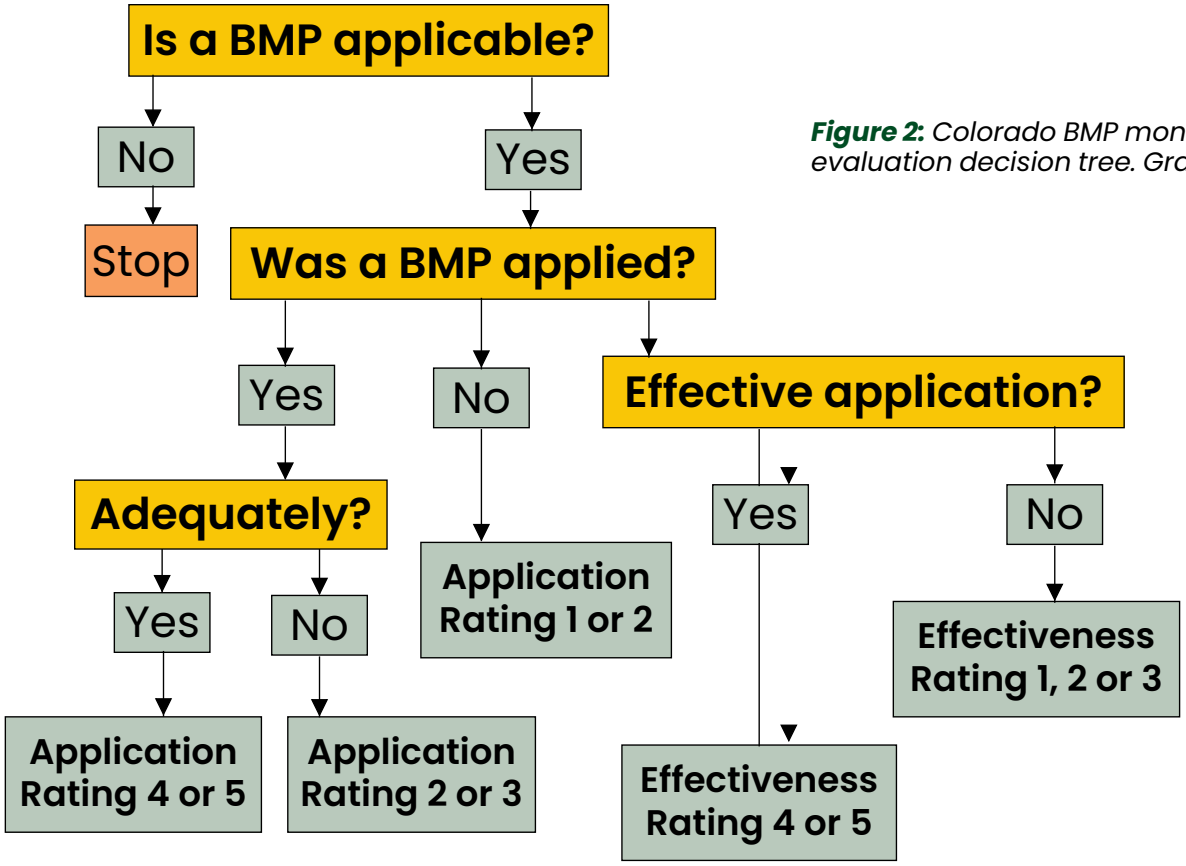

Figure 2: *Colorado BMP monitoring evaluation decision tree. Graphic: CSFS*

Table 1: *BMP application ratings and criteria*

Rating	Criteria
5	Operation exceeds requirements of BMP
4	Operation meets the standard requirement of BMP
3	Minor departure from BMP
2	Major departure from BMP
1	Gross neglect of BMP

Table 2: *BMP effectiveness ratings and criteria*

Rating	Criteria
5	Improves protection of soil and water resources over pre-project conditions
4	Adequate protection of soil and water resources
3	Minor and temporary impact to soil and water resources
2	Major and temporary or minor and prolonged impacts to soil and water resources
1	Major and prolonged impacts to soil and water resources

DEFINITIONS OF EFFECTIVENESS TERMS

- **Adequate:** Small amount of material eroded, but does not reach draws, channels or floodplain
- **Minor:** Some material erodes and is delivered to stream or annual floodplain
- **Major:** Material erodes and is delivered to stream or annual floodplain
- **Temporary:** Impacts last less than one season
- **Prolonged:** Impacts last more than one year

The monitoring team then evaluated the BMP effectiveness, which determined whether the BMP was successful in protecting water quality, again based on written criteria (Table 2).

As monitoring sites were visited, the team kept notes about how the monitoring review worksheets might be improved. Those findings are included in the recommendations portion of this report.

Limitations of the monitoring process

The small sample size and lack of a representative sample design prevent a rigorous statistical interpretation of the monitoring results. However, the monitoring team's ratings and observations allow general conclusions about rates of BMP application and are therefore appropriate for general communication and outreach regarding the BMP process.

Practicality, time and team member availability prohibit evaluation of every forest treatment project for continual compliance with BMPs. Instead, the monitoring process is designed to act as a "spot check," which is limited to areas of the projects that have the greatest potential to affect water quality. The timing of monitoring throughout the duration of the project is also constrained, in that monitoring cannot thoroughly examine the layout, actual treatment work and closeout activities to which BMPs apply. Evaluation of BMPs relating to time is necessarily based on implementation to date, where final results may not yet be realized. For example, sites where culverts and other drainage features were found to be functioning properly do not necessarily predict what will occur longer term (but does point to the likelihood of continued functionality).

FIELD MONITORING RESULTS

In 2025, BMPs were applied nearly 50% of the time for all possible rating criteria over the five selected monitoring sites (79 rating criteria evaluated per site), with 196 recorded BMP applications out of a total possible 395 criteria (Table 4). This is a slightly greater application rate compared to the 2023 results where BMPs were applied 43% of the time for all possible criteria over six selected sites.

The BMP application results from the 2025 field monitoring are summarized in Table 3. The project with the highest rate of meeting or exceeding BMP standards was the federal project (1-FS), which met the BMP standard in 100% of cases where applied. The lowest rate of meeting BMP standards was found at the 5-PR project site, meeting the BMP standard on 82% of the application criteria, and rated as having a minor departure on the remaining 18%.

Table 3: *Colorado Forestry BMP 2025 field monitoring application results by project*

Project	BMP applied	Exceeded BMP	Met BMP standard	Minor departure	Major departure	Gross neglect
1-FS	25	0	25	0	0	0
	32%	0%	100%	0%	0%	0%
2-PR	58	0	54	4	0	0
	73%	0%	93%	7%	0%	0%
3-CO	46	0	43	3	0	0
	58%	0%	93%	7%	0%	0%
4-PR	39	0	38	1	0	0
	49%	0%	97%	3%	0%	0%
5-PR	28	0	23	5	0	0
	35%	0%	82%	18%	0%	0%
Total	196/395	0/196	183/196	13/196	0/196	0/196
	49.6%	0%	93%	7%	0%	0%

The overall applications of BMP standards across all monitored projects in 2025 were found to meet the standard. As compared to previous years, no 2025 projects were rated as exceeding BMP standards, but also none were found to have major departures or gross neglect.

Table 4 shows how BMP effectiveness was rated across the five project sites in 2025. Across all 2025 projects where 196 BMP criteria applied, 191 (97%) resulted in a finding that the application provided adequate protection of soil and water resources.

Included in this figure are nine cases of a minor departure from the BMP guidance where there was deemed adequate protection.

In general, BMPs were properly applied and effective in most cases for the projects visited in 2025. Table 5 illustrates the 2025 BMP application and effectiveness rating results for all projects, compared to the results of the previous 2008, 2012, 2014, 2016, 2018, 2021 and 2023 monitoring periods. No major and prolonged effects were observed during any of the monitoring periods to date.

Table 4: *Colorado forestry BMP 2025 field monitoring effectiveness results by sale*

Project	BMP applied	Improved conditions	Adequate protection	Minor and temporary	Minor/prolonged or major/temporary	Major and prolonged
1-FS	25	0	25	0	0	20
		0%	100%	0%	0%	100%
2-PR	58	0	57	0	1	0
		0%	98%	0%	2%	0%
3-CO	46	0	46	0	0	0
		0%	100%	0%	0%	0%
4-PR	39	0	39	0	0	0
		0%	100%	0%	0%	0%
5-PR	28	0	24	4	0	0
		0%	86%	14%	0%	0%
Total	196	0	191	4	1	0
		0%	97%	2%	1%	0%

Table 5: *Comparison of BMP application and effectiveness results by year (2008-2025)*

Application	Exceeded BMP	Met BMP standard	Minor departure	Major departure	Gross neglect
2008	3%	83%	11%	3%	0%
2012	2%	84%	10%	4%	0%
2014	2%	80%	13%	3%	2%
2016	5%	79%	10%	6%	0%
2018	4%	91%	5%	0%	0%
2021	0%	96%	4%	0%	0%
2023	2%	94%	3%	1%	0%
2025	0%	93%	7%	0%	0%

Effectiveness	Improved conditions	Adequate protection	Minor and temporary	Minor/prolonged or major/temporary	Major and prolonged
2008	1%	81%	15%	3%	0%
2012	2%	86%	12%	0%	0%
2014	1%	83%	16%	0%	0%
2016	2%	88%	4%	6%	0%
2018	3%	97%	0%	0%	0%
2021	1%	96%	3%	0%	0%
2023	1%	98%	1%	0%	0%
2025	0%	97%	2%	1%	0%

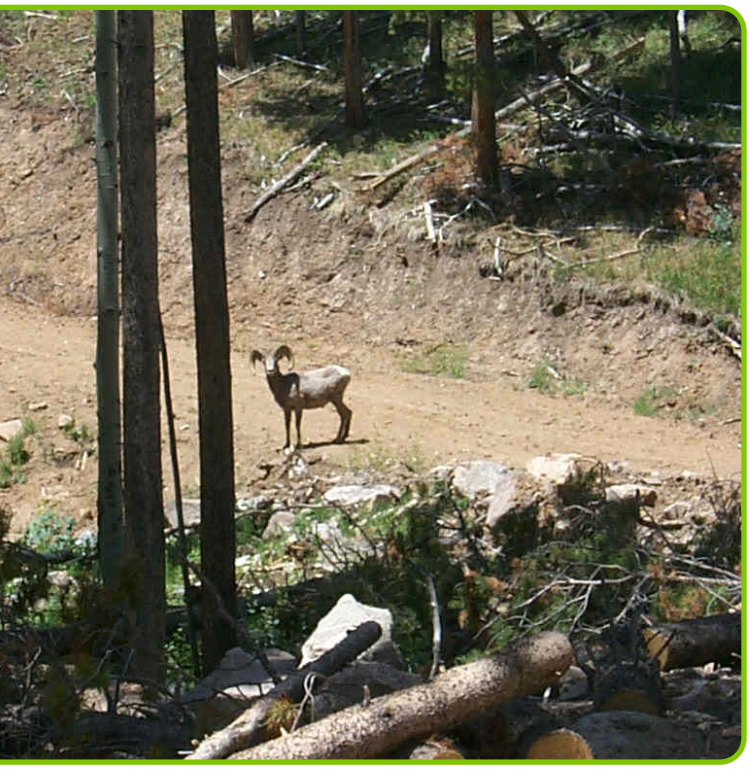

Photo 4: *Roads have the highest potential for sedimentation from forest management activities and therefore constitute a major focus for BMP monitoring. Photo: CSFS*

Based on the 2025 forestry BMP monitoring, the following observations were made. The order of the observations below parallels the BMP guidance document.

Planning

Sanitary guidelines for the construction of camps

Camping occurred only on the county project (3-CO). There were offices and a maintenance shop adjacent to the project units. Thus, sanitation facilities were present and available to work crews, and the BMP application standard was met and deemed effective in the protection of the water resources at this project site.

Roads

Road design and location

Existing roads were used on all monitored project sites in 2025.

On both 4-PR and 5-PR project sites, travel and access roads were used under frozen conditions. For all projects, existing road usage and closeout were evaluated as adequately protecting soil and water resources.



Photo 5: *Ensure that streamside management zones (SMZs) are clearly marked, even when using virtual boundaries. Photo: Mark Loveall, CSFS*

Road construction/reconstruction

New access roads were constructed on only the FS-1 project. Here, the roads were constructed to the minimal standard necessary for the equipment used on the project. This kept the road length and earth moving disturbance to the least amount possible. It was noted that during the treatment, the project administrator and contractor halted operations when wet conditions occurred, protecting the roads, soil and water quality.

Following completion of the project, these new roads were decommissioned by ripping the road surface to reverse the compaction that occurred during operations. Next, the roads were covered with slash to minimize erosion risk and discourage any future use.

Road drainage

The adequacy of road drainage and the necessity of drainage features was a major focus of the 2025 BMP monitoring team.

On all projects, most criteria within this category did not apply, and when the BMP requirements were applied, they were done so satisfactorily. There were, however, two notable exceptions.

On the 2-PR project, there was a steep section of existing road that was observed to be in a constant state of erosion, most likely even before use during the project. This issue was pointed out to the project administrators who planned to discuss it with the landowner. The monitoring team noted that the erosion issues in this area would continue and possibly increase in coming years without the installation of features to allow water to exit the roadway, such as drain dips or water bars.

On the 3-CO project, a score of 3 (minor departure from BMP) was given for the criterion of providing adequate drainage on all roads. This was because some sections of roads had material buildup on both sides of the road, which would not allow proper drainage during a large precipitation event. No erosion was observed at the time of monitoring, and the roads in question were quite distant from water features and had relatively low incline.

Road maintenance

This category involves five criteria for existing roads either providing access to, or travel within, treatment areas. These criteria do not apply to temporary roads or skidding trails. All five projects evaluated in 2025 met the requirements of the maintenance BMPs and provided for adequate protection of soil and water resources.

Generally, all projects maintained the erosion control features present, avoided the use of roads in wet conditions and graded roads only as necessary. As noted below, the 5-PR project had some issues with equipment causing ruts in areas thought to be frozen but had no problems with existing roads that were either dry or frozen during use. On the 4-PR project, contractors were allowed to use roads in wet conditions with project administrators on site to ensure no damage occurred.

SMZ delineation

SMZs were identified on 4 of 5 project sites. On the 1-FS, 3-PR and 4-PR projects, the monitoring team determined that SMZs were properly identified, adequate widths were applied and were clearly marked. On the 2-PR project, the SMZ was not marked, resulting in scores indicating minor departures in application. However, the lack of marking was determined not to have caused any damage to soil and water resources, as the single stream crossing on the project was used only when frozen.

While there were no streams within the treatment units or crossing access roads in the 5-PR project, patches of willow and other hydrophilic plants indicated the likelihood of springs and a high water table much of the year. These conditions were recognized by both project planners, administrators and the contractor, and work was allowed to commence under frozen ground conditions. Unfortunately, in several instances equipment drove onto ground not completely frozen and caused some rutting. The operators immediately recognized the problem, ceased work and removed the equipment.

The monitoring team looked at these rutted areas almost a full growing season following treatment. They determined that these areas were indeed SMZs and may have been evident earlier in the season but were minor departures from the recommended BMP application that resulted in minor and temporary impacts to soil and water resources. These findings were further justified by the contractor's successful efforts to remedy the ruts, the quick return of vegetation to the area and the overall flat topography of the project area that limited the risk of soil erosion.

All projects evaluated retained trees and other vegetation within SMZs and contractors refrained from depositing slash, chips or road material into SMZs.

Stream crossings and stream bank protection

Three of the five projects evaluated in 2025 did not have any applicable BMP requirements related to stream crossings and stream bank protection. The 2-PR and 4-PR projects had BMP applications in this category, with both projects meeting the BMP requirements and providing adequate protection of soil and water resources.

On the 2-PR project, it was necessary to cross a small stream to access a large portion of the project area. Not wanting to have equipment crossing the stream when flowing, the administrators and contractor planned to cross this stream and treat the area beyond only after the stream and ground were demonstrably frozen. The monitoring visit occurred during the growing season immediately following treatment and panel members noted that there was no apparent sign of vehicle crossings.

At the 4-PR site, there was an unimproved stream crossing on an old road that for many years has been used by the landowners for access, mostly using ATVs and occasionally 4WD automobiles. Prior to equipment using this crossing, the contractor placed logs perpendicular to the road within the waterway and on both crossing approaches. This material blocked soil damage by preventing direct contact between wheels and surface materials, as well as minimizing moist soil compaction by distributing equipment weight over a large surface area. Logs were removed following project closeout and placed on dry ground away from the stream.

In both instances, the risks to water quality were recognized by the project planners and were properly addressed by differing means. The result in each case was that both projects met BMP requirements in their applications and adequately protected soil and water resources.



Photo 6: *Inspecting stream crossing on the 4-PR project. Photo: Mark Loveall, CSFS*



Photo 7: *Slash covering temporary roads on the 1-FS project. Photo: Mark Loveall, CSFS*

Forest treatment and revegetation

Treatment design and activities

All five projects monitored in 2025 included wood product removal off site. In discussion with project planners and administrators at all sites, they all expressed concern for the risks to soil from hauling and skidding equipment while acknowledging the need to remove sufficient biomass volume to achieve treatment objectives. Projects used existing roads wherever possible while constructing no new roads. The use of temporary roads and skidding trails was minimized, and impacts were repaired.

On the 4-PR project, two BMP criteria were in conflict. One BMP for treatment design recommends that the design and location of skidding trails should minimize soil disturbance. Often this translates to locating skidding trails on the least steep ground. On this project, a possible skid trail location with minimal steepness happened to be located close to a stream so project planners made the decision to choose a route with steeper terrain farther away from the stream. With the addition of mitigation measures such as construction of drainage features, the monitoring team agreed that this was the appropriate choice.

The 5-PR illustrates the tensions between project objectives and BMP recommendations that sometimes occur. This was a project at high elevation in a valley containing perennial and intermittent streams. The project planners recognized that there were likely some wet areas within the treatment boundaries that were not evident at the surface but needed to remove biomass across as much acreage as possible to restore forest function and health in the area. The risk of driving equipment into an undiscovered wet area was mitigated by the project requirement to operate only when the ground was frozen. At this elevation, the ground remains frozen throughout much of the winter unlike lower areas along the Front Range. However, on one spot along a temporary access route into a treatment, a vehicle drove into an area that remained unfrozen and created a short section of ruts. The vehicle proceeded no further, and before leaving the area, the operator repaired the ruts. When the monitoring team visited this area, it was obvious that a vehicle had driven into the area but also noted that the area was recovering well. The rating given in this instance was that the application of the BMP was a minor deviation from recommendations (rating of 3), with minor and temporary effect on soil and water (rating of 3).



Photo 8: *Masticated slash within treatment unit on the 4-PR project. Photo: Mark Loveall, CSFS*

Slash treatment and site preparation

All five 2025 projects applied the majority of five criteria in this category as per BMP recommendations to provide adequate resource protection. No project contained deliberate scarification on steep slopes (criterion 5), while occasional scarification was accomplished through material dragging, and equipment operation did not cause any resource concerns. Across all projects, the monitoring team found there was adequate material left on site to slow any potential runoff. The actual amounts of material left on site varied. On the 1-FS project, most slash materials were piled for burning, but some was left to provide erosion control for temporary roads closeout (Figure 9). In contrast, slash on the 4-PR project was masticated and left within treatment units (Figure 10), while access roads were left in a condition for future use by the landowners.

Revegetation/reforestation of disturbed areas

All five 2025 projects applied the BMP standard for ensuring adequate revegetation and/or reforestation of disturbed areas. On four of the five projects, temporary roads and skidding trails were covered with woody material to prevent erosion and future vehicle access and to promote natural revegetation. On the 5-PR project, the rutting issues that occurred necessitated future reseeding and if necessary, weed spraying. All five projects where this BMP was applicable met the effectiveness requirement for providing adequate resource protection.

Hazardous substances including pesticides, fertilizers and chemicals

Herbicides were employed on the 2-PR, 3-CO and 4-PR projects to prevent emergent weeds from becoming established post-treatment. In these cases, weed spraying was accomplished by certified applicators following all necessary requirements and therefore were found to have adequately applied the BMP standard. As noted above, the 5-PR project may require herbicide application in the future, although none had been used at the time of monitoring.

On all projects, contractors properly handled fuels and other equipment fluids as per BMP recommendations throughout operations. No projects employed fertilizers as a component of the overall treatment activities.

Wildfire and prescribed fire management

Piles were constructed and burnt only on the 1-FS project but were located an adequate distance from SMZs to eliminate the possibility of ash, sediment and debris entering a waterway. The other two criteria in this category pertain to wildfire effects that did not apply to any of the five monitored projects.

RECOMMENDATIONS

As noted in the 2023 BMP Field Monitoring Report, the BMP guide update was in progress at the time of monitoring and unavailable. For the 2025 field monitoring, the ranking forms were updated to align with the BMP guide. While the ranking forms were an improvement over the 2023 version, there were several criteria the monitoring team recommended additional editing. These suggestions will be one of the first activities undertaken when a new team is convened for the 2027 field monitoring.

The following are recommendations regarding the Colorado BMPs program in general, and those that arose from observations during the 2025 monitoring:

- As recommended in this and previous monitoring summaries, there is a continuous need for focused outreach and training in this subject-matter area for forestry and logging operators, landowners and managers.
- While statewide meetings such as the annual CTIA and Society of American Foresters meetings provide opportunities to provide outreach to a significant portion of contractors and resource managers, local or regional events must also be considered.
- With the increase in GNA projects and others that include multiple ownerships (federal, private and state), practitioners need to be aware of the possibility of differing BMP requirements on differing ownerships. Communication is essential in the project planning phases of complex multi-jurisdictional forestry projects as to required BMP applications.
- The findings of machinery incursions into marked SMZs during the 2023 monitoring, and equipment travel into wet areas assumed to be frozen in 2025 point to the vital importance of frequent and effective project administration. For administrators, it is critical to clearly communicate expectations and determine site visitation based on values at risk.
- Projects are becoming increasingly complex, and effective treatment requires projects at larger scales and across boundaries. Additionally, many areas remaining to be treated are located on lands with steeper terrain, limited access and increased resource damage risk. Several projects monitored during 2025 fit this description and required great skill at all stages of the project process.
- Resource managers should not be shy about tackling complex projects. This is essential work that needs to be done. Collaboration with other partnering experts is essential to bring all possible experience to bear on complex landscapes.

SUMMARY

Consistent with previous years' monitoring results, the 2025 monitoring team found that the application of BMPs in forestry and logging operations in Colorado met or exceeded the BMP requirements at a rate of 93%, and an effectiveness rate (adequate or improved soil and water protection) of 97% across the five sites evaluated. The monitoring team was pleased overall with the ratings during the 2025 monitoring and believes that the application and effectiveness rates can be maintained or improved with updated guidance and continued education and outreach.

The increasing prominence of large-scale and cross-boundary forest treatments in response to growing risk factors points to the need to constantly emphasize and evaluate Colorado's BMPs, while educating resource managers, contractors and stakeholders as to their proper application. Increasing the pace and scale of forest treatments should not come at the cost of degrading soil and water resources and is not a zero-sum endeavor: The number and scale of forest health treatments can be increased while maintaining or enhancing soil and water quality. The continuation of BMP monitoring is an important component of maintaining Colorado's vital natural resources.

The success of the BMP program's monitoring efforts relies on team members willing to devote time toward project evaluation. Just as important is the availability of projects for evaluation. The monitoring team is extremely grateful for the project administrators, contractors and landowners who have allowed their work to be examined critically, often in cases where not everything went according to plan. It is in these difficult situations where valuable lessons are learned, and the willingness of resource professionals to show the good and not-so-good in their work is greatly appreciated.

APPENDIX A

Forest Treatment Project Identification	1-FS		2-PR		3-CO		4-PR		5-FS	
PLANNING	**Application**	**Effectiveness**	**Application**	**Effectiveness**	**Application**	**Effectiveness**	**Application**	**Effectiveness**	**Application**	**Effectiveness**
A. Sanitary Guidelines for the Construction of Camps Adequate sewer and soil waste considerations on site to protect water quality if camps are present.	n/a	n/a	n/a	n/a	4	4	n/a	n/a	n/a	n/a
ROADS	**Application**	**Effectiveness**	**Application**	**Effectiveness**	**Application**	**Effectiveness**	**Application**	**Effectiveness**	**Application**	**Effectiveness**
A. Road Design and Location Design roads to minimum standard necessary to accommodate anticipated use and equipment.	4	4	4	4	4	4	n/a	n/a	n/a	n/a
Minimize number and length of roads necessary.	4	4	4	4	4	4	n/a	n/a	n/a	n/a
Use existing roads unless aggravated erosion will be likely.	4	4	4	4	4	4	4	4	4	4
Avoid long and/or steep road grades.	n/a	n/a	4	4	4	4	n/a	n/a	n/a	n/a
Locations avoid high-hazard sites (i.e., wet areas and unstable slopes).	n/a	n/a	4	4	4	4	n/a	n/a	n/a	n/a
Minimize number of stream crossings.	n/a	n/a	4	4	4	4	n/a	n/a	n/a	n/a
Cross streams at stable sites.	n/a	n/a	4	4	n/a	n/a	n/a	n/a	n/a	n/a
Locate roads to provide access to suitable log landing areas.	n/a	n/a	4	4	4	4	n/a	n/a	n/a	n/a
Locate roads a safe distance from streams.	n/a	n/a	4	4	4	4	n/a	n/a	n/a	n/a
Keep roads outside of Streamside Management Zones.	n/a	n/a	4	4	4	4	n/a	n/a	n/a	n/a

Forest Treatment Project Identification	1-FS		2-PR		3-CO		4-PR		5-FS	
B. Road Construction/ Reconstruction	Application	Effectiveness	Application	Effectiveness	Application	Effectiveness	Application	Effectiveness	Application	Effectiveness
Construct/reconstruct only to the extent necessary to provide adequate drainage and safety.	4	4	4	4	4	4	4	4	4	4
Minimize earth moving activities when soils appear excessively wet.	4	4	4	4	4	4	4	4	4	4
Keep slope stabilization, erosion, sediment control work as current as possible, including “slash filter windrows”.	n/a	n/a	n/a	n/a	4	4	n/a	n/a	n/a	n/a
Cut and fill slopes at stable angles.	n/a	n/a	4	4	n/a	n/a	n/a	n/a	n/a	n/a
Stabilize exposed soils (i.e., seeding, benching, mulching).	n/a	n/a	4	4	4	4	n/a	n/a	n/a	n/a
Avoid incorporating woody material in road fill.	n/a	n/a	4	4	3	4	n/a	n/a	n/a	n/a
Leave existing rooted trees and shrubs at the toe of fill slope.	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
Balance cuts and fills or use full bench construction.	n/a	n/a	4	4	n/a	n/a	n/a	n/a	n/a	n/a
Minimize use of road base or other material from borrow pits and gravel pits.	n/a	n/a	4	4	4	4	n/a	n/a	n/a	n/a
Avoid placing excess materials in a location that could enter a stream.	n/a	n/a	4	4	4	4	n/a	n/a	n/a	n/a
Avoid excavation into ground water.	n/a	n/a	4	4	4	4	n/a	n/a	n/a	n/a
Exclude side-casting of road material into a stream, lake, wetland or other body of water.	n/a	n/a	4	4	n/a	n/a	n/a	n/a	n/a	n/a
C. Road Drainage Vary road grade to reduce concentrated drainage.	n/a	n/a	4	4	4	4	n/a	n/a	n/a	n/a
Provide adequate road surface drainage for all roads.	n/a	n/a	3	2	3	4	4	4	4	4

Forest Treatment Project Identification	1-FS		2-PR		3-CO		4-PR		5-FS	
	Application	Effectiveness	Application	Effectiveness	Application	Effectiveness	Application	Effectiveness	Application	Effectiveness
Space road drainage outlets so runoff will not exceed capacity of drainage outlets.	n/a	n/a	4	4	n/a	n/a	n/a	n/a	n/a	n/a
For in-sloped roads, plan ditch gradients of generally greater than 2%, but no more than 8%.	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
Construct drain dips deep enough into the sub-grade so that traffic will not obliterate them.	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
Install culverts at original gradient, otherwise rock armor or anchor downspouts.	n/a	n/a	4	4	n/a	n/a	n/a	n/a	n/a	n/a
Design all relief culverts with adequate length and appropriate skew. Protect inflow end from erosion.	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
Provide energy dissipaters at drainage structure outlets where needed.	n/a	n/a	4	4	n/a	n/a	4	4	n/a	n/a
Route road drainage through adequate filtration zones before entering a stream.	n/a	n/a	4	4	4	4	4	4	4	4
D. Road Maintenance Maintain erosion control features if present (dips, ditches and culverts functional).	4	4	4	4	4	4	4	4	n/a	n/a
Avoid use of roads during wet periods.	4	4	4	4	4	4	3	4	4	4
Grade roads only as necessary to maintain drainage.	4	4	4	4	4	4	4	4	4	4
Avoid cutting the toe of cut slopes if present.	n/a	n/a	n/a	n/a	3	4	4	4	n/a	n/a
Exclusion of side-casting of road material into a stream.	n/a	n/a	4	4	4	4	n/a	n/a	n/a	n/a
Abandoned roads in condition to provide adequate drainage without further maintenance.	4	4	n/a	n/a	4	4	4	4	4	4

Forest Treatment Project Identification	1-FS		2-PR		3-CO		4-PR		5-FS	
E. Streamside Management Zone Designation	Application	Effectiveness	Application	Effectiveness	Application	Effectiveness	Application	Effectiveness	Application	Effectiveness
Apply adequate SMZ width.	4	4	3	4	4	4	4	4	3	4
SMZ clearly and properly marked.	4	4	3	4	4	4	4	4	4	4
Maintain or provide sufficient ground cover.	4	4	4	4	4	4	4	4	4	4
Allow equipment operation in SMZ only per approved practices.	4	4	4	4	n/a	n/a	4	4	3	3
Exclude pile burning in SMZ.	4	4	4	4	n/a	n/a	n/a	n/a	n/a	n/a
Retain appropriate trees in SMZ (larger trees retained to provide habitat and a source of large woody debris).	4	4	4	4	n/a	n/a	4	4	4	4
Exclude side-casted road material into a stream, lake, wetland or other body of water during maintenance.	4	4	4	4	n/a	n/a	4	4	n/a	n/a
Exclude slash or masticated material in streams or other bodies of water.	4	4	4	4	4	4	4	4	3	4
Protect SMZ during site preparation activities.	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
F. Stream Crossings and Stream Bank Protection Proper permits for stream crossings obtained (if needed).	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
Cross streams at right angles, if practical.	n/a	n/a	4	4	n/a	n/a	4	4	n/a	n/a
Proper size structures for stream crossing.	n/a	n/a	4	4	n/a	n/a	4	4	n/a	n/a
Direct road drainage away from stream crossing site.	n/a	n/a	n/a	n/a	n/a	n/a	4	4	n/a	n/a
Avoid unimproved stream crossings.	n/a	n/a	3	4	n/a	n/a	4	4	n/a	n/a

Forest Treatment Project Identification	1-FS		2-PR		3-CO		4-PR		5-FS	
G. Installation of Stream Crossings	Application	Effectiveness	Application	Effectiveness	Application	Effectiveness	Application	Effectiveness	Application	Effectiveness
Minimize stream channel disturbance.	n/a	n/a	n/a	n/a	n/a	n/a	4	4	n/a	n/a
No material placed in stream channels.	n/a	n/a	n/a	n/a	n/a	n/a	4	4	n/a	n/a
Stream crossing culverts conform to natural streambed and slope.	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
Culverts placed slightly below stream grade.	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
Prevent erosion of stream crossing culverts and bridge fills (i.e., armor inlet and outlet).	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
Minimum cover for stream crossing culverts provided.	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
Stream diversions are carefully planned to minimize downstream sedimentation.	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
FOREST TREATMENT AND REVEGETATION	Application	Effectiveness	Application	Effectiveness	Application	Effectiveness	Application	Effectiveness	Application	Effectiveness
A. Treatment Design Suitable logging system for topography, soil type and season of operation.	4	4	4	4	4	4	4	4	4	4
Design and locate skid trails/primary transport network to minimize soil disturbance.	4	4	4	4	4	4	4	4	3	3
Suitable location, size, and number of landings.	n/a	n/a	4	4	4	4	4	4	4	4
B. Treatment Activities Skidding operations minimize soil compaction and displacement.	4	4	4	4	3	4	4	4	4	4
Avoid tractor skidding on unstable, wet or easily compacted soils and on slopes that exceed 40% unless not causing excessive erosion.	4	4	4	4	4	4	4	4	3	3
Adequate drainage for landing.	4	4	4	4	4	4	4	4	4	4

Forest Treatment Project Identification	1-FS		2-PR		3-CO		4-PR		5-FS	
Adequate drainage for skid trails.	Application	Effectiveness	Application	Effectiveness	Application	Effectiveness	Application	Effectiveness	Application	Effectiveness
	4	4	4	4	4	4	4	4	4	3
C. Slash Treatment and Site Preparation Scarify only to the extent necessary to meet resource management objective.	4	4	4	4	4	4	4	4	4	4
Treat slash so as to preserve the surface soil horizon.	4	4	4	4	4	4	4	4	4	4
Adequate material left to slow runoff, return soil nutrients and provide shade for seedlings.	4	4	4	4	4	4	4	4	4	4
Activities limited to frozen or dry conditions to minimize soil compaction and displacement.	4	4	4	4	4	4	4	4	4	4
Scarification on steep slopes in a manner that minimizes erosion.	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
D. Revegetation of Disturbed Areas Practices have been completed to ensure adequate revegetation in disturbed areas, if required.	n/a	n/a	4	4	4	4	4	4	4	4
HAZARDOUS SUBSTANCES & OPERATIONS	Application	Effectiveness	Application	Effectiveness	Application	Effectiveness	Application	Effectiveness	Application	Effectiveness
Know and comply with regulations governing the storage, handling, etc., of hazardous substances.	4	4	4	4	4	4	4	4	4	4
Proper sites were selected for servicing and refueling to prevent contamination of waters from accidental spills.	4	4	4	4	4	4	4	4	4	4
Pesticide materials have been properly applied and effects monitored.	n/a	n/a	4	4	4	4	4	4	n/a	n/a
Fertilizers have been properly handled and applied so as to reduce possible adverse effects on water quality.	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a

Forest Treatment Project Identification	1-FS		2-PR		3-CO		4-PR		5-FS	
WILDFIRE & PRESCRIBED FIRE MANAGEMENT	Application	Effectiveness	Application	Effectiveness	Application	Effectiveness	Application	Effectiveness	Application	Effectiveness
A. Protection of Soil and Water from Prescribed Burning Effects Soil erosion is minimized. Ash, sediment, nutrients and debris are prevented from entering surface water, and SMZ is maintained.	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
B. Stabilization of Fire Suppression Related Work Damage Areas disturbed by fire suppression activities have been restored.	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
C. Emergency Rehabilitation of Watersheds Impacted by Wildfires Corrective measures have been applied to minimize soil loss, deterioration of water quality, and threats to life and property, both on-site and off-site.	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a

CO - BMP1
Year: 2025

BMP FIELD MONITORING
SITE INFORMATION and RANKING CRITERIA

Site Number: _____ Meets Selection Criteria: ☐ Yes ☐ No

Site Name: _____

Owner(s): _____

Legal Description: TWP. _____ RNG. _____ SEC. _____ County: _____

Primary Drainage: _____ Month/Year Harvested: _____

Stream Within 200 Ft.? ☐ Y ☐ N Name: _____ Bankfull Width: _____

Unit Size (Ac): _____ Volume Removed (MBF): _____

Road Construction: YES ☐ (If yes, when)_____ NO ☐ Length: _____

Road Reconstruction: YES ☐ (If yes, when)_____ NO ☐ Length: _____

Slash Disposal Complete: YES ☐ NO ☐ Method: _____

Logging Method: _____

Slope: 0-5% ☐; 5-20% ☐; 20-40% ☐; 40%+ ☐

Harvest in SMZ: YES ☐ NO ☐

Comments:

Rating Guide

APPLICATION
5—Operation Exceeds Requirements Of Bmp
4—Operation Meets Requirements Of Bmp
3—Minor Departure From Bmp
2—Major Departure From Bmp
1—Gross Neglect Of Bmp

EFFECTIVENESS
5—Improved Protection Of Soil And Water Resources Over Pre-Project Condition
4—Adequate Protection Of Soil And Water Resources
3—Minor And Temporary Impacts On Soil & Water Resources
2—Major And Temporary Or Minor And Prolonged Impacts On Soil And Water Resources.
1—Major And Prolonged Impacts On Soil And Water Resources.

DEFINITIONS (BY EXAMPLE)
Adequate—Small amount of material eroded; Material does not reach draws, channels, or floodplain.
Minor—Erosion and delivery of material to draws but not stream.
Major—Erosion and subsequent delivery of sediment to stream or annual floodplain.
Temporary—Impacts lasting one year or less; no more than one runoff season.
Prolonged—Impacts lasting more than one year.

NR – Not Reviewed NA – Not Applicable

FIELD MONITORING

Date: _____

Team Leader/Recorder: _____

Team Members Present:

☐ ☐
☐ ☐
☐ ☐
☐ ☐
☐ ☐

Other Observers Present:

COLORADO FOREST PRACTICES REVIEW WORKSHEET

RECOMMENDED BEST MANAGEMENT PRACTICES	APPLICABLE TO SITE (Y/N)	APPLICATION	EFFECTIVENESS	COMMENTS
PLANNING (Guidelines page reference*)				
SANITARY GUIDELINES FOR THE CONSTRUCTION OF CAMPS 1. Adequate sewer and soil waste considerations on site to protect water quality if camps are present. (*page 33)	☐			
ROADS BMPs Applicable to: + New Road Construction # Existing Roads ➢ Reconstruction				
ROAD DESIGN AND LOCATION				
➢+ 1. Design roads to minimum standard necessary to accommodate anticipated use and equipment. (*page 56)	☐			
➢+ 2. Minimize number & length of roads necessary.(*page 56)	☐			
# 3. Use existing roads unless aggravated erosion will be likely. (*page 56)	☐			
+ 4. Avoid long and/or steep road grades. (*page 56)	☐			
+ 5. Locations avoid high-hazard sites (i.e., wet areas and unstable slopes). (*page 56)	☐			
+ 6. Minimize number of stream crossings. (*page 56)	☐			
+ 7. Cross streams at stable sites. (*page 56)	☐			
+ 8. Locate roads to provide access to suitable log landing areas. (*page 56)	☐			
+ 9. Locate roads a safe distance from streams. (*page 56)	☐			
+ 10. Keep roads outside of Stream Management Zones. (*page 56)	☐			
ROAD CONSTRUCTION / RECONSTRUCTION				
➢ # 1. Construct/reconstruct only to the extent necessary to provide adequate drainage & safety (*page 57)	☐			
+➢#2. Minimize earth moving activities when soils appear excessively wet. (*page 57)	☐			

+➢	3.	Keep slope stabilization, erosion, sediment control work as current as possible, including “slash filter windrows”. (*page 57)	☐			
+➢	4.	Cut and fill slopes at stable angles. Slope ratio: _____. (*page 57)	☐			
+➢	5.	Stabilize exposed soils (i.e., seeding, benching, mulching). (*page 57)	☐			
+➢	6.	Avoid incorporating woody material in road fill. (*page 57)	☐			
+➢	7.	Leave existing rooted trees and shrubs at the toe of fill slope. (*page 57)	☐			
+➢	8.	Balance cuts and fills or use full bench construction. (*page 57)	☐			
+➢	9.	Minimize use of road base or other material from borrow pits & gravel pits (*page 57)	☐			
+➢	10.	Avoid placing excess materials in a location that could enter a stream. (*page 57)	☐			
+➢	11.	Avoid excavation into groundwater. (*page 58)	☐			
+➢	12.	Exclude side-casting of road material into a stream, lake, wetland or other body of water. (*page 58)	☐			
ROAD DRAINAGE			☐			
+	1.	Vary road grade to reduce concentrated drainage. (*page 58)				
+➢#	2.	Provide adequate road surface drainage for all roads. (*page 58)	☐			
+➢	3.	Space road drainage outlets so runoff will not exceed capacity of drainage outlets. (*page 58)	☐			
+➢	4.	For in-sloped roads, plan ditch gradients of generally greater than 2%, but no more than 8%.(*page 58)	☐			
+➢	5.	Construct drain dips deep enough into the sub grade so that traffic will not obliterate them. (*page 58)	☐			
+➢	6.	Install culverts at original gradient, otherwise rock armor or anchor downspouts. (*page 58)	☐			
+➢#	7.	Design all relief culverts with adequate length and appropriate skew. Protect inflow end from erosion. (*page 58)	☐			
+➢#	8.	Provide energy dissipators at drainage structure outlets where needed. (*page 59)	☐			
+➢#	9.	Route road drainage through adequate filtration zones before entering a stream. (*page 59)	☐			

ROAD MAINTENANCE +➢# 1. Maintain erosion control features if present. (dips, ditches and culverts functional). (*page 59)	☐			
+➢# 2. Avoid use of roads during wet periods. (*page 59)	☐			
+➢# 3. Grade roads only as necessary to maintain drainage. (*page 59)	☐			
# 4. Avoid cutting the toe of cut slopes if present. (*page 59)	☐			
+➢ 5. Exclusion of side-casting of road material into a stream. (*page 59)	☐			
+➢# 6. Abandoned roads in condition to provide adequate drainage without further maintenance. (*page 59)	☐			
STREAMSIDE MANAGEMENT ZONE DESIGNATION 1. Apply adequate SMZ width (avg. _____ (*page 44)	☐			
2. SMZ clearly and adequately marked. (*p 44)	☐			
3. Maintain or provide sufficient ground cover. (*page 44)	☐			
4. Allow equipment operation in SMZ only per approved practices. (*page 44)	☐			
5. Exclude pile burning in SMZ. (*page 44)	☐			
6. Retain appropriate trees in SMZ. (larger trees retained to provide habitat and a source of large woody debris). (*page 44)	☐			
7. Exclude side-casted road material into a stream, lake, wetland or other body of water during road maintenance. (*page 45)	☐			
8. Exclude slash or masticated material in streams or other bodies of water. (*page 45)	☐			
9. Protect SMZ during site preparation activities. (*page 45)	☐			
STREAM CROSSINGS AND STREAM BANK PROTECTION ➢+ 1. Proper permits (i.e. 404) for stream crossings obtained (if needed). (*page 45)	☐			
➢+ 2. Cross streams at right angles, when practical. (*page 45)	☐			
➢+ 3. Properly size structures for stream crossing. (*page 45)	☐			
➢+ 4. Direct road drainage away from stream crossing site. (*page 45)	☐			
➢+ 5. Avoid unimproved stream crossings. (*page 45)	☐			
INSTALLATION OF STREAM CROSSINGS ➢+ 1. Minimize stream channel disturbance. (*page 45)	☐			
➢+ 2. No material placed in stream channels. (*page 45)	☐			

➢+ 3. Stream crossing culverts conform to natural streambed and slope. (*page 45)	☐			
➢+ 4 Culverts placed slightly below stream grade. (*page 45)	☐			
➢+ 5. Prevent erosion of stream crossing culverts and bridge fills (i.e., armor inlet and outlet). (*page 46)	☐			
➢+ 6. Minimum cover for stream crossing culverts provided. (*page 46)	☐			
+➢ 7. Stream diversions are carefully planned to minimize downstream sedimentation. (*page 46)	☐			

FOREST TREATMENT AND REVEGETATION

TREATMENT DESIGN 1. Suitable logging system for topography, soil type and season of operation. (*page 22)	☐			
2. Design and locate skid trails/primary transport network to minimize soil disturbance (*page 22)	☐			
3. Suitable location, size, and number of landings. (*page 22)	☐			
TREATMENT ACTIVITIES 1. Skidding operations minimize soil compaction and displacement. (*page 22)	☐			
2. Avoid tractor skidding on unstable, wet or easily compacted soils and on slopes that exceed 40% unless not causing excessive erosion. (*page 22)	☐			
3. Adequate drainage for landing. (*page 22)	☐			
4. Adequate drainage for skid trails. (*page 22)	☐			
SLASH TREATMENT AND SITE PREPARATION 1. Scarify only to the extent necessary to meet resource management objective. (*page 22)	☐			
2. Treat slash so as to preserve the surface soil horizon. (*page 22)	☐			
3. Adequate material left to slow runoff, return soil nutrients and provide shade for seedlings.(*page 22)	☐			
4. Activities limited to frozen or dry conditions to minimize soil compaction and displacement. (*page 22)	☐			
5. Scarification on steep slopes in a manner that minimizes erosion. (*page 22)	☐			
REFORESTATION/REVEGETATION OF DISTURBED AREAS 1. Practices have been completed to ensure adequate revegetation in disturbed areas, if required. (*page 22)	☐			

HAZARDOUS SUBSTANCES & OPERATIONS				
1. Know and comply with regulations governing the storage, handling, etc. of hazardous substances. (*page 98)	☐			
2. Proper sites were selected for servicing and refueling to prevent contamination of waters from accidental spills. (*page 98)	☐			
3. Pesticide materials have been properly applied and effects monitored. (*page 98)	☐			
4. Fertilizers have been properly handled and applied so as to reduce possible adverse effects on water quality. (*page 98)	☐			
WILDFIRE AND PRESCRIBED FIRE MANAGEMENT				
PROTECTION OF SOIL AND WATER FROM PRESCRIBED BURNING EFFECTS 1. Soil erosion is minimized. Ash, sediment, nutrients and debris are prevented from entering surface water, and SMZ is maintained. (*page 90, SMZ page 45)	☐			
STABILIZATION OF FIRE SUPPRESSION RELATED WORK DAMAGE 1. Areas disturbed by fire suppression activities have been restored. (*page 90)	☐			
EMERGENCY REHABILITATION OF WATERSHEDS IMPACTED BY WILDFIRES 1. Corrective measures have been applied to minimize soil loss, deterioration of water quality, and threats to life and property, both on-site and off-site. (*page 90)	☐			

ADDITIONAL COMMENTS: (include significant weather events since the harvest if known)



COLORADO STATE FOREST SERVICE
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CSFS MISSION

To achieve stewardship of Colorado's diverse forest environments for the benefit of present and future generations

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